



UNUSUAL CASE OF MULTIPLE LIVER ABSCESES DUE TO SALMONELLA TYPHI IN AN IMMUNOCOMPETENT MALE

Microbiology

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ABSTRACT

Liver abscess remains a diagnostic dilemma and concerning problem from clinical outcome angle. The etiological agents and risk factors of the liver abscess have seen evolving trend over the years. Salmonella Typhi a traditional agent of typhoid fever is never considered as an important proponent in liver abscess though it is being increasingly isolated from extra-intestinal sites such as liver, bones, joints, breast tissue etc. It is because of these reasons that rapid identification of the causative agent becomes crucial for obtaining successful outcomes through institution of effective management tools and any omission or delay in catching this organism may prove detrimental to the clinical course of the disease.

KEYWORDS

Liver abscess, Salmonella Typhi, typhoid fever

Introduction

Liver abscess is a collection of purulent material in the liver parenchyma which may be result of infection by protozoal, bacterial, parasitic, fungal or mixed pathogens. The source of these organisms may be gastrointestinal tract, biliary system or some cryptic focus in the body (through hematogenous route). [1, 2] Penetrating trauma has also been implicated as a cause of liver abscess. Escherichia coli and Klebsiella pneumoniae have been identified as the most common pathogens in liver abscess. Staphylococcus, Clostridium perfringens, Pseudomonas spp. and anaerobes have been reported as less important causes. [3] Salmonellae have rarely been associated with liver abscess and literature research links only five serovars viz Typhi, Paratyphi A, Entertidis, Infantis and Dublin with liver abscess. [1, 2] Salmonella Typhi and Paratyphi are exclusive human pathogens that cause enteric fever. During the course of illness, the organisms multiply in lymph nodes, liver and spleen. In liver, most of the organisms get killed through microbicidal potential of Kupffer cells and the organism that escape the host defences, attack the liver cells through various virulence factors and may result in liver abscess.

Here we report a case of liver abscess caused by Salmonella enterica serovar Typhi in an Immuno-competent male.

Case report

A 35 years old male was admitted to the Medicine department of our hospital with one week history of high grade fever with chills and rigors, moderate pain in the right hypochondrium region. Patient gave history of high grade fever with pain abdomen about six months back for which he had taken treatment from a private practicing physician and his clinical features got mitigated with treatment Patient was a chronic alcoholic. He had no previous history of bowel disturbance or dysentery. There was no history of tuberculosis or diabetes in the past. On examination, he was conscious, febrile (temperature 39°C), pulse rate 96/min, and blood pressure were 108/76 mm. He had icterus, but pallor was absent. Per abdomen examination elicited the tenderness in the right hypochondrium and epigastric region, and liver was palpable about 5 cm below the costal margin. Respiratory examination uncovered decreased air entry and pleural rub on the right side. Rest of the systemic examination was within normal limits.

Routine hematological investigations revealed hemoglobin 14 gm%, total leucocyte count 20,000/mm³ (polymorphs 61%, lymphocytes 26%, eosinophils 2%, and basophils 1%) and platelet count of 2.5 lacs/mm³. Values of total bilirubin, ALT, AST and alkaline phosphatase were 6.6 mg/dL, 100 U/L, 72 U/L and 800 U/L respectively. Renal function tests and serum electrolytes were within reference ranges. Serology for HIV, hepatitis B surface antigen and hepatitis C virus were nonreactive. Widal test, Tyhidot and IgM leptospira were negative.

Ultrasonography of the abdomen showed enlargement of the liver with

features suggestive of multiple liver abscesses scattered across different segments. There was evidence of one abscess measuring 176 cc in segment VII, 50 cc in segment IV and 10 cc in segments V. Chest-X-ray revealed elevation of right hemidiaphragm and blunting of right cardiophrenic angle.

Ultrasound guided liver aspiration was done. About 150 ml of pus was aspirated and sent for microbiological investigations. The pus sample was processed as per standard microbiological techniques. A wet mount of pus was negative for trophozoites of Entamoeba histolytica. Gram smear showed Gram negative bacilli along with pus cells. Ziehl Neelsen stain was negative for acid fast bacilli. On blood agar, 2-3mm diameter non-hemolytic colonies and on MacConkey agar, nonlactose fermenting colonies were obtained. The isolate was identified as S. enterica subspecies enterica serovar Typhi on the basis of biochemical reactions and further confirmation was done by agglutination test with specific antisera. It was found to be susceptible to ampicillin, cotrimoxazole, cephalosporins of third generation, and ciprofloxacin by Kirby Bauer disc diffusion method. Blood and urine cultures were sterile. No pathogenic organism was grown in stool culture. Since blood culture, Widal, Tyhidot were negative, three more stool and urine samples were investigated for evidence of S. Typhi to exclude the possibility of carrier state.

The patient received Ceftriaxone intravenously for 7 days based on the sensitivity report and made an uneventful recovery. On follow-up, he was asymptomatic.

Discussion

Hepatic abscess can be pyogenic, amoebic, and fungal. Pyogenic liver abscess (PLA) is a rare presentation and most frequently caused by Bacteroides, Enterococcus, E. coli, Klebsiella, Streptococcus and Staphylococcus. [3]

PLA due to Salmonella species is rare and have been reported with some predisposing factor including gallstones, hydatid cysts, amoebic abscesses and tumours. [4, 5] However in our patient no such pre-existing condition could be elicited. Furthermore, Salmonella are also known to cause abscess in immunocompromised conditions but this patient had no features of compromised immune function.

The primary pathophysiological mechanism involved in typhoid Salmonella infection is invasion of the mucosa of distal ileum followed by bacteraemia and seeding in different organs. In this subject case, it is perceived that the organism could possibly have caused primary insult couple of months back when the patient give history of high grade fever with pain abdomen which was relieved with treatment from a local practitioner. The organism at that time probably managed to survive in gall bladder and acted as a supply chain of organism or their toxic metabolites for the liver since the patient was a chronic alcoholic, alcohol could have caused some trauma of hepatic parenchyma which

acted as a nidus for development of multiple abscesses.[6, 7] Non recovery of Typhi from repeated stool and urine raises the possibility of persistence of the organisms in a form, the mechanisms of which are a matter of large scientific enquiry. It may be speculated that an intracellular pathogen may survive in ecological corner not conducive for normal existence and may persist in stealthy form without provoking inimical immune response, immune modulation or immune escape. Hepatitis may be an intrinsic aspect of natural history of Salmonellosis associated with persistence.

Pyogenic abscesses can be single or multiple, but Salmonella abscesses are predominantly solitary and located in the right lobe. [8] But in the current case, there were multiple liver abscesses.

Salmonellosis is usually diagnosed by blood cultures and stool cultures. But it is occasionally difficult to diagnose PLA on blood cultures as in up to 50% cases it may be negative. In this case also blood culture was sterile. Ultrasonography and other imaging studies have been shown good sensitivity in the diagnosis of pyogenic liver abscess. [9] Culture of percutaneous ultrasound guided pus aspirate helps in establishing microbiological aetiology and planning further therapeutic plans. [9]

Conclusion

Liver abscesses may not be very common but demand cognizance because of associated serious complications which sometimes may prove fatal. It is simply because of this understanding and apprehension that an all-out effort shall be needed to pick up the causative agent so that appropriate therapy can be instituted. Since Salmonella Typhi is not an important cause of pyogenic liver abscess, local epidemiological factors coupled with detailed clinical history can help the clinician to be more vigilant about the possibility of organisms like Typhi. Microbiological examination of ultrasound or CT guided aspirations undertaken early in the course of illness can go a long way in identifying causative agent and reducing associated morbidity and mortality.

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